



# PENNSYLVANIA VEGETABLE MARKETING & RESEARCH PROGRAM

2301 NORTH CAMERON STREET, HARRISBURG, PENNSYLVANIA 17110-9405

717.694.3596

## Pennsylvania Vegetable Growers Association

An association of commercial vegetable, potato and berry growers.

815 Middle Road, Richfield, Pennsylvania 17086-9205 717-694-3596 pvga@pvga.org www.pvga.org

### Vegetable Research Grower Survey Results

Results from 121 surveys returned

Growers were asked to indicate their level of problem or concern for each of the following issues for the various major vegetable crops. Their choices were: N/A Minimal Moderate Considerable

In tabulating the responses, "N/A" and no answer were recorded as null. Minimal was recorded as "1", Moderate as "2" and Considerable as "3". In the first column below, the average listed is the average of those responding as Minimal, Moderate or Considerable. In the second, third and fourth columns are the percentage of respondents who answered that question indicating minimal, moderate or considerable damage or concern respectively.

Growers were also asked whether they felt research was needed on each of these issues. The percentages reported here are, in the fifth column, the percentage that indicated "yes" research is needed of all the surveys returned and, in the sixth column, the percentage that indicated "yes" research is needed of all those who answered "yes" or "no". Many surveys were returned with neither "yes" or "no" indicated.

Highlighted responses indicate issues that growers identified as having greater priority. Issues are highlighted if the first column is 2.0 or greater, if the fifth column is 33% or greater, or if the sixth column is 67% or greater.

Underneath each section are additional comments from growers.

#### What kind of crops do you grow?

Retail Fresh Market - 53

Wholesale Fresh Market - 49

Processing - 7

Greenhouse- 28

| SNAP BEAN   | LEVEL of PROBLEM or CONCERN |       |       |       | RESEARCH NEEDED |             |
|---|-----------------------------|-------|-------|-------|-----------------|-------------|
|   | Avg                         | % Min | % Mod | % Con | % of Total      | % of Answer |
| <b>Cultural practices</b>   |                             |       |       |       |                 |             |
| <i>No-till production</i>   | 1.5                         | 64%   | 20%   | 16%   | 10%             | 29%         |
| <b>Disease control</b>  |                             |       |       |       |                 |             |
| <i>White mold</i>   | 1.6                         | 56%   | 31%   | 13%   | 15%             | 43%         |
| <i>Root rots</i>  | 1.5                         | 62%   | 24%   | 13%   | 13%             | 41%         |
| <i>Gray mold</i>  | 1.5                         | 56%   | 36%   | 9%    | 14%             | 43%         |
| <b>Insect control</b>   |                             |       |       |       |                 |             |
| <i>Aphid/Virus issues</i>   | 1.5                         | 60%   | 31%   | 10%   | 12%             | 38%         |
| <i>Corn borer</i>   | 1.6                         | 61%   | 20%   | 20%   | 13%             | 39%         |
| <b>Weed control</b>   |                             |       |       |       |                 |             |
| <i>Annual broadleaf weeds</i>   | 1.8                         | 41%   | 39%   | 20%   | 20%             | 55%         |
| <i>Annual grass weeds</i>   | 1.7                         | 51%   | 25%   | 24%   | 16%             | 45%         |
| <i>Perennial weeds (e.g. Canada thistle, quackgrass, horsenettle)</i> | 2.0                         | 30%   | 36%   | 34%   | 24%             | 64%         |
| <b>Other (specify below)</b>  |                             |       |       |       |                 |             |
| <i>Dog Bane, Tarnished Plant Bug, Yellow Nutgrass</i>                 |                             |       |       |       |                 |             |

| TOMATO  | LEVEL of PROBLEM or CONCERN |       |       |       | RESEARCH NEEDED |             |
|---|-----------------------------|-------|-------|-------|-----------------|-------------|
|   | Avg                         | % Min | % Mod | % Con | % of Total      | % of Answer |
| <b>Cultural practices</b>                     |                             |       |       |       |                 |             |
| <i>Variety selection</i>                      | 1.7                         | 44%   | 44%   | 12%   | 20%             | 55%         |
| <i>Nutrient management</i>                    | 2.0                         | 24%   | 56%   | 21%   | 28%             | 72%         |
| <i>Organic production</i>                     | 1.8                         | 39%   | 39%   | 23%   | 12%             | 41%         |
| <i>Vegetable grafting</i>                     | 1.8                         | 38%   | 44%   | 18%   | 14%             | 49%         |
| <b>Disease control</b>                        |                             |       |       |       |                 |             |
| <i>Bacterial canker, spot, speck</i>          | 1.9                         | 38%   | 30%   | 32%   | 28%             | 68%         |
| <i>Early blight, Septoria leaf spot</i>       | 1.9                         | 36%   | 42%   | 22%   | 28%             | 67%         |
| <i>Late blight</i>                            | 1.8                         | 42%   | 40%   | 18%   | 26%             | 60%         |
| <i>Wilt diseases (Fusarium, Verticillium)</i> | 1.7                         | 43%   | 45%   | 12%   | 20%             | 49%         |
| <b>Insect control</b>                         |                             |       |       |       |                 |             |
| <i>Worms</i>                                  | 1.4                         | 69%   | 24%   | 6%    | 10%             | 25%         |
| <i>Aphids</i>                                 | 1.5                         | 59%   | 33%   | 8%    | 11%             | 28%         |
| <i>Thrips</i>                                 | 1.7                         | 51%   | 31%   | 18%   | 21%             | 48%         |
| <i>Stink bugs, plant bugs</i>                 | 1.4                         | 67%   | 23%   | 9%    | 17%             | 43%         |
| <b>Weed control</b>                           |                             |       |       |       |                 |             |
| <i>Nutsedge</i>                               | 1.7                         | 52%   | 27%   | 21%   | 19%             | 49%         |
| <i>Morning glory and solanaceous weeds</i>    | 1.9                         | 40%   | 29%   | 31%   | 20%             | 49%         |
| <i>Weed control in plasticulture</i>          | 1.7                         | 45%   | 40%   | 16%   | 21%             | 57%         |
| <i>Weed control in bare soil</i>              | 1.7                         | 52%   | 27%   | 21%   | 12%             | 38%         |
| <b>Physiological disorders</b>                |                             |       |       |       |                 |             |
| <i>Yellow shoulder</i>                        | 1.8                         | 35%   | 45%   | 20%   | 19%             | 53%         |
| <i>Blotchy ripening</i>                       | 1.8                         | 34%   | 49%   | 17%   | 18%             | 52%         |
| <b>Other (specify below)</b>                  |                             |       |       |       |                 |             |
| <i>Leaf Mold, Timber Rot</i>                  |                             |       |       |       |                 |             |

| SWEET CORN   | LEVEL of PROBLEM or CONCERN |       |       |       | RESEARCH NEEDED |             |
|--|-----------------------------|-------|-------|-------|-----------------|-------------|
|  | Avg                         | % Min | % Mod | % Con | % of Total      | % of Answer |
| <b>Cultural practices</b>  |                             |       |       |       |                 |             |
| <i>No-till production</i>  | 1.8                         | 40%   | 40%   | 20%   | 13%             | 42%         |
| <i>Nutrition &amp; spacing to max. 1<sup>st</sup> ear yield</i>  | 1.8                         | 37%   | 43%   | 20%   | 23%             | 68%         |
| <i>Bird control</i>  | 2.1                         | 25%   | 39%   | 35%   | 23%             | 64%         |
| <b>Disease control</b>   | 1.6                         | 53%   | 35%   | 12%   | 12%             | 45%         |
| <b>Insect control</b>  |                             |       |       |       |                 |             |
| <i>Corn earworm</i>  | 2.0                         | 28%   | 42%   | 30%   | 26%             | 69%         |
| <i>European corn borer</i>   | 1.8                         | 39%   | 43%   | 18%   | 17%             | 53%         |
| <i>Fall armyworm</i>   | 1.7                         | 46%   | 35%   | 19%   | 16%             | 50%         |
| <b>Insect control (continued)</b>  |                             |       |       |       |                 |             |
| <i>Worms in general</i>  | 1.9                         | 31%   | 48%   | 20%   | 23%             | 65%         |
| <i>Sap beetle</i>  | 1.5                         | 59%   | 32%   | 10%   | 8%              | 32%         |
| <i>Improving the trapping network</i>  | 1.7                         | 55%   | 24%   | 21%   | 13%             | 44%         |
| <b>Weed control</b>  |                             |       |       |       |                 |             |
| <i>Triazine-resistant weeds</i>  | 1.7                         | 46%   | 34%   | 20%   | 15%             | 50%         |
| <i>Replacements for atrazine</i>   | 1.9                         | 32%   | 50%   | 18%   | 21%             | 68%         |
| <i>Perennial weed control</i>  | 2.0                         | 27%   | 49%   | 24%   | 21%             | 64%         |
| <i>No-till weed control</i>  | 1.9                         | 34%   | 38%   | 28%   | 14%             | 50%         |
| <i>Label field corn herbicides for sweet corn</i>  | 2.2                         | 23%   | 38%   | 40%   | 27%             | 78%         |
| <b>Other (specify below)</b>   |                             |       |       |       |                 |             |
| <i>Slug damage, control trapping guides, wildlife, atrazine replacement, spacing and yields, corn leaf aphid control, rust</i> |                             |       |       |       |                 |             |

| CUCURBITS   | LEVEL of PROBLEM or CONCERN |       |       |       | RESEARCH NEEDED |             |
|---|-----------------------------|-------|-------|-------|-----------------|-------------|
|   | Avg                         | % Min | % Mod | % Con | % of Total      | % of Answer |
| <b>Cultural practices</b>   |                             |       |       |       |                 |             |
| <i>No-till production</i>   | 1.7                         | 48%   | 35%   | 16%   | 13%             | 48%         |
| <i>Fertility for no-till</i>  | 1.7                         | 45%   | 39%   | 15%   | 14%             | 50%         |
| <i>Variety selection</i>  | 1.5                         | 63%   | 23%   | 14%   | 17%             | 49%         |
| <i>Organic production</i>   | 1.9                         | 33%   | 40%   | 27%   | 14%             | 50%         |
| <b>Disease control</b>  |                             |       |       |       |                 |             |
| <i>Powdery mildew</i>   | 2.1                         | 16%   | 54%   | 29%   | 45%             | 83%         |
| <i>Downy mildew</i>   | 2.2                         | 14%   | 49%   | 36%   | 49%             | 88%         |
| <i>Phytophthora blight</i>  | 2.0                         | 30%   | 44%   | 27%   | 32%             | 68%         |
| <i>Wilt diseases (Fusarium, Verticillium)</i>   | 1.9                         | 41%   | 33%   | 27%   | 25%             | 60%         |
| <i>Viruses</i>  | 1.9                         | 34%   | 43%   | 22%   | 23%             | 58%         |
| <b>Insect control</b>   |                             |       |       |       |                 |             |
| <i>Cucumber beetles</i>   | 2.3                         | 17%   | 40%   | 43%   | 39%             | 72%         |
| <i>Squash bug</i>   | 1.9                         | 32%   | 44%   | 24%   | 26%             | 57%         |
| <i>Squash vine borer</i>  | 1.8                         | 37%   | 42%   | 22%   | 23%             | 56%         |
| <i>Aphid/Virus issues</i>   | 1.7                         | 44%   | 40%   | 16%   | 22%             | 49%         |
| <b>Weed control</b>   |                             |       |       |       |                 |             |
| <i>In planting hole for mulched crops</i>   | 1.7                         | 41%   | 48%   | 11%   | 18%             | 54%         |
| <i>No-till pumpkin</i>  | 2.2                         | 17%   | 49%   | 34%   | 23%             | 73%         |
| <i>Herbicide resistant weeds</i>  | 1.7                         | 50%   | 34%   | 16%   | 16%             | 51%         |
| <b>Other (specify below)</b>  |                             |       |       |       |                 |             |
| <i>Night shade control, no-til seedless watermelons, more options for weed spraying, develop RR cucurbits</i> |                             |       |       |       |                 |             |

| COLE CROPS  | LEVEL of PROBLEM or CONCERN |       |       |       | RESEARCH NEEDED |             |
|---|-----------------------------|-------|-------|-------|-----------------|-------------|
|   | Avg                         | % Min | % Mod | % Con | % of Total      | % of Answer |
| <i>Anthracnose</i>  | 1.6                         | 55%   | 34%   | 10%   | 7%              | 33%         |
| <i>Other Diseases – Black Rot</i>                                 |                             |       |       |       |                 |             |
| <i>Other Diseases - Alternaria</i>                                |                             |       |       |       |                 |             |
| <i>Thrips</i>   | 1.3                         | 78%   | 13%   | 9%    | 5%              | 26%         |
| <i>Other – slugs, plant bugs, flea beetles, worms in broccoli</i> |                             |       |       |       |                 |             |
| <i>Other – Nutrient management in heat</i>                        |                             |       |       |       |                 |             |

| HIGH TUNNEL PRODUCTION                                     | LEVEL of PROBLEM or CONCERN |       |       |       | RESEARCH NEEDED |             |
|--|-----------------------------|-------|-------|-------|-----------------|-------------|
|  | Avg                         | % Min | % Mod | % Con | % of Total      | % of Answer |
| <b>Cultural practices</b>                                  |                             |       |       |       |                 |             |
| <i>Variety selection</i>                                   | 1.8                         | 40%   | 40%   | 20%   | 16%             | 60%         |
| <i>Nutrient Management</i>                                 | 2.2                         | 18%   | 46%   | 36%   | 23%             | 76%         |
| <i>Soil Health</i>   | 2.2                         | 21%   | 44%   | 36%   | 23%             | 76%         |
| <i>Crop Rotation</i>                                       | 1.9                         | 32%   | 43%   | 24%   | 15%             | 57%         |
| <i>Variety selection</i>                                   | 1.8                         | 37%   | 43%   | 20%   | 11%             | 48%         |
| <i>Biological controls</i>                                 | 2.1                         | 17%   | 53%   | 31%   | 22%             | 76%         |
| <b>Disease control</b>                                     |                             |       |       |       |                 |             |
| <i>Leaf mold</i>   | 1.8                         | 38%   | 41%   | 21%   | 12%             | 54%         |
| <i>Soilborne diseases</i>                                  | 1.9                         | 33%   | 38%   | 28%   | 17%             | 68%         |
| <b>Insect pests</b>  |                             |       |       |       |                 |             |
| <i>Spider mites</i>  | 1.8                         | 43%   | 32%   | 24%   | 17%             | 69%         |
| <b>Other (specify below)</b>                               |                             |       |       |       |                 |             |
| <i>Nematodes, Wilting Tomato plants, pill bugs, aphids</i> |                             |       |       |       |                 |             |

| ORGANIC/SUSTAINABLE                         | LEVEL of PROBLEM or CONCERN |       |       |       | RESEARCH NEEDED |             |
|---|-----------------------------|-------|-------|-------|-----------------|-------------|
|   | Avg                         | % Min | % Mod | % Con | % of Total      | % of Answer |
| <b>Cultural practices</b>                   |                             |       |       |       |                 |             |
| <i>Variety selection</i>                    | 1.7                         | 52%   | 28%   | 20%   | 7%              | 47%         |
| <i>Compost use</i>                          | 1.8                         | 45%   | 32%   | 23%   | 7%              | 44%         |
| <i>Nutrient management</i>                  | 2.0                         | 22%   | 52%   | 26%   | 13%             | 68%         |
| <i>Soil health</i>                          | 2.1                         | 30%   | 33%   | 37%   | 17%             | 77%         |
| <b>Disease control</b>                      |                             |       |       |       |                 |             |
| <i>Evaluation of OMRI approved products</i> | 2.0                         | 29%   | 39%   | 32%   | 17%             | 70%         |
| <b>Insect control</b>                       |                             |       |       |       |                 |             |
| <i>Evaluation of OMRI approved products</i> | 2.2                         | 25%   | 32%   | 43%   | 18%             | 75%         |
| <b>Weed control</b>                         |                             |       |       |       |                 |             |
| <i>Evaluation of OMRI approved products</i> | 1.9                         | 46%   | 21%   | 33%   | 13%             | 60%         |
| <i>Effects of cover crops on weeds</i>      | 2.0                         | 24%   | 48%   | 28%   | 16%             | 69%         |
| <i>Mechanical weed control options</i>      | 1.7                         | 43%   | 39%   | 17%   | 8%              | 45%         |
| <b>Other (specify below)</b>                |                             |       |       |       |                 |             |
| <i>Soil balance</i>                         |                             |       |       |       |                 |             |

| GENERAL TOPICS  | SPECIFY CONCERN OR PROBLEM AREA WHERE RESEARCH IS NEEDED <i>(include what crops are involved if appropriate)</i>  |
|---|---|
| <i>High tunnel production</i>                           | white mold botrytis, weed control, nutrient control, tomatoes – nematode infestations, tomato & alternative crops for efficiency and profit, soil health, how to reduce trapped insects in top of H.T., crop rotation, broad mite                             |
| <i>Irrigation water management</i>                      | water quality to meet FSMA – sweet corn, tomatoes, timing, irrigation management in tomatoes, high pH water remedies, food safety issues/testing, best moisture testing equipment, bacteria in rain water, automation/Fertigation, address Fertigation issues |
| <i>Alternative to chemical soil fumigation</i>          | what is available & effective   |
| <i>Greenhouse vegetable production</i>                  | zucchini, whitefly control in tomatoes, products to control botrytis, mold, can veggies and flowers grow well in the same greenhouse?   |
| <i>Soiless growing systems</i>                          | strawberry production, bag culture – tomatoes and cucumbers   |
| <i>Bacterial Diseases</i>                               | tomatoes, vine crops, pumpkins  |
| <i>Biological controls – greenhouse/tunnel</i>          | tomatoes, Strawberries, efficacy of different products, aphid control   |
| <i>Biological controls - field</i>                      | tomatoes, Cucurbits, Strawberries, price effective insect & disease control, cucumber beetle  |
| <i>Cover Crops</i>                                      | all crops, weed control – sudan grass, cold soil cover crops, pros & cons of cover crop cocktails, early sweet corn, July harvest to fall plowing, early season, benefits, types, timing  |
| <i>Crop Rotation</i>                                    | Always beneficial to all growers and crops, need educated   |
| <i>Compost use</i>                                      |   |
| <i>Invasive Species – Allium leaf miner, BMSB, etc.</i> | onions, peppers, tomatoes, garlic, Allium leaf miner, research on pesticide or deterrent for allium leaf miner  |
| <i>Pollinators – honey bees</i>                         | promote, causes of colony collapse  |
| <i>Pollinators – native bees</i>                        | yes – all fruit crops, promote, identify species/how to encourage them  |
| <i>Soil Health</i>                                      | used to plant then harvest now its plant, spray, spray, spray every other day then harvest; research on getting soil life back.   |
| <i>Efficacy of phosphorus acid products</i>             |   |
| <i>Practical food safety methods</i>                    | food safety at farmers markets, always can learn more about this  |
| <i>New crop or marketing opportunities</i>              | the talk at Hershey on figs was good - planted some this spring, rhubarb – cultural practices, major area of concern with changing consumers and traditional outlets, hemp, always looking for something new  |
| <b>Other</b> <i>(specify below)</i>                     |   |
| <i>Wildlife</i>   | high population of deer – ways to keep deer out other than fencing, deer control – over population, game commission won't allow trapping.   |
| <i>Roadside Marketing</i>                               |   |
| <i>Organic/Sustainable</i>                              |   |
| <i>Occultation effects on soil biology</i>              |   |
|   |   |